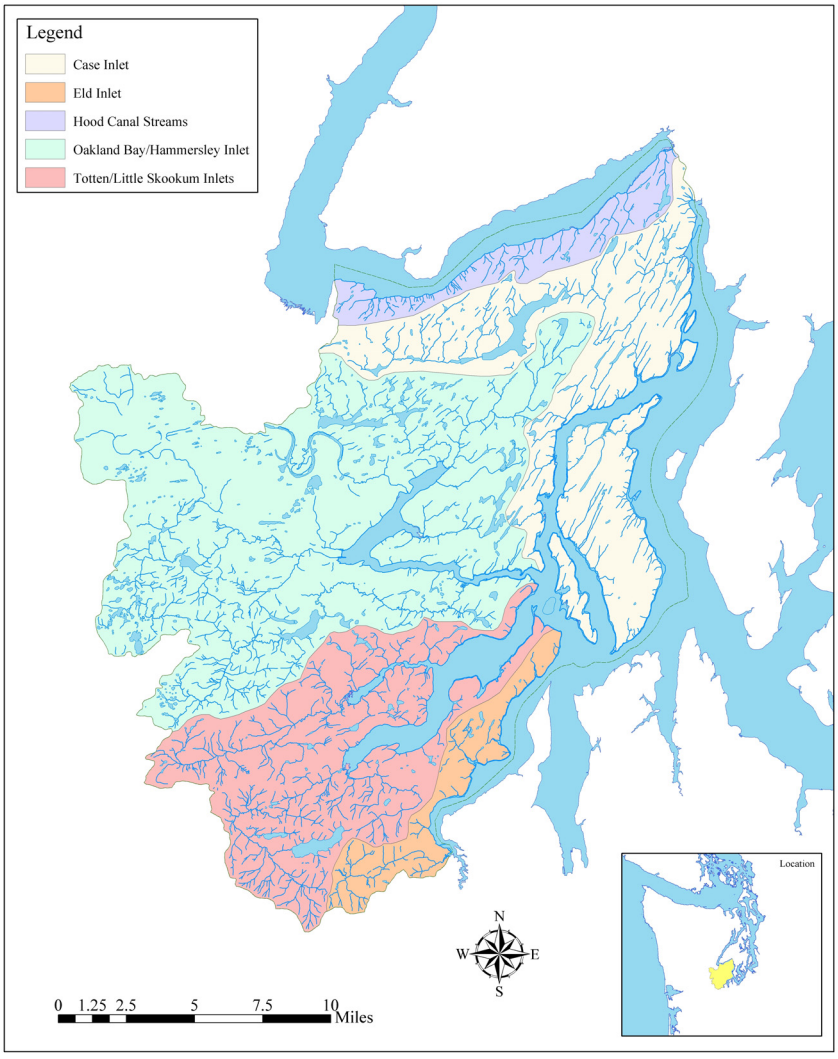
Washington State Conservation Commission

SALMONID HABITAT LIMITING FACTORS WATER RESOURCE INVENTORY AREA 14, KENNEDY-GOLDSBOROUGH BASIN



FINAL REPORT
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Chum salmon spawning in Kennedy Creek fall 2000.
Photo Courtesy of the Allyn Salmon Enhancement Group.

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ABBREVIATIONS AND ACRONYMS

ASEG: Allyn Salmon Enhancement Group
CFS: Cubic Feet per Second
CREP: Conservation Reserve Enhancement Program
CRP: Conservation Reserve Program
DO: Dissolved Oxygen
DOE: Washington Department of Ecology
EQIP: Environmental Quality Incentives Program
ESA: Endangered Species Act
FSA: Farm Service Agency (USDA)
IFIM: Instream Flow Incremental Methodology
LB: Left Bank of stream (looking downstream)
LWD: Large Woody Debris
MCD: Mason Conservation District
NRCS: USDA Natural Resource Conservation Service (formerly SCS)
NMFS: National Marine Fisheries Service
NWIFC: Northwest Indian Fisheries Commission
RB: Right Bank of stream (looking downstream)
RCW: Revised Code of Washington
RM: River Mile
SASSI: Salmon and Steelhead Stock Inventory (WDFW 1992)
SaSI: Salmonid Stock Inventory (WDFW 1998-present)
SCS: USDA Soil Conservation Service (now NRCS)
SSHIAP: Salmon and Steelhead Habitat Inventory and Assessment Project (NWIFC)
SRFB: Washington State Salmon Recovery Funding Board
TSS: Total Suspended Solids
USACE: United States Army Corps of Engineers
USDA: United States Department of Agriculture
USFS: United States Forest Service
USFWS: United States Fish and Wildlife Service
WAC: Washington Administrative Code
WAU: Watershed Administrative Unit
WCC: Washington State Conservation Commission
WDF: Washington Department of Fisheries
WDFW: Washington Department of Fish and Wildlife
WHIP: Wildlife Habitat Incentives Program
WRIA: Water Resource Inventory Area

EXECUTIVE SUMMARY

This report describes and assesses salmonid habitat in the Kennedy-Goldsborough Basin, Water Resource Inventory Area (WRIA) 14. The region encompasses the extreme southwest terminus of Puget Sound, including a portion of Eld Inlet, the entirety of Totten Inlet, Little Skookum Inlet, Oakland Bay and Hammersley Inlet, Pickering Passage, and a portion of Case Inlet. This report examines salmonid habitat only. No attempt has been made to evaluate harvest or hatchery issues. These important factors in the decline of anadromous salmonids are being dealt with by other entities. The report is a summary of existing knowledge from both published and unpublished literature, data, and interviews of people with technical expertise in the region. The WRIA 14 limiting factors report is intended for use in prioritization of salmonid habitat restoration/protection projects. It is not a recovery plan for salmonids, although it could be a component of such a plan. Habitat conditions (primarily in freshwater) are described, then assessed based on standards developed from published sources and consultations with local natural resource agency personnel. Causes of habitat degradation are addressed in a general sense. General restoration/protection recommendations are included for the entire WRIA.

Water Resource Inventory Area 14 covers about 381 square miles of the southwest terminus of Puget Sound. The area is characterized by numerous independent tributary streams that drain to several inlets within the Sound. No major river system is present. Lakes and wetlands are widespread throughout the area (Washington Department of Fisheries 1975). The terrain and drainage network are largely the result of past glacial episodes that gauged out the inlets and deposited and reworked large amounts of gravel, sand, and clay sediments (Molenaar and Noble 1970). Climate is generally mild with wet winters and cool, dry summers (Thurston County Planning Department 1989). With the exception of the Black Hills in the extreme southwest portion of the WRIA, the majority of the area is low elevation hills and valleys. The streams draining this region are rainfall-dominated and subject to low summer flows because of the lack of snow pack. However, the porous glacial sediments common throughout the basin encourage connectivity between surface waters and groundwater aquifers. Groundwater, wetlands, and beaver ponds all contribute to maintaining summer stream flows (Molenaar and Noble 1970).

Logging has been the dominant industry in the area since the arrival of Euro-American settlers in the 1850s. Old-growth, or late seral, coniferous forests dominated the region at that time. Trees 14 feet in diameter were common (Deegan 1960). Today the vast majority of WRIA 14 is dominated by early and mid-seral forests. Late seral forests cover only 1% of the region (Washington Department of Fish and Wildlife 1996). Riparian canopy closure throughout WRIA 14 is generally inadequate to maintain state water quality temperature standards (Schuett-Hames *et al.* 1996). Streambank condition was generally characterized as fair to poor. The glacial sediments common to WRIA 14 are susceptible to erosion unless they are stabilized by riparian vegetation (Washington State Department of Natural Resources and Simpson Timber Company 1995).

Disruptions of floodplain connectivity have occurred on some streams, but in general floodplain connectivity was characterized as good to fair (TAG 2002). Eroding streambanks and runoff from logging roads, highways, and residential development have contributed fine sediment to streams throughout WRIA 14. In general, substrate embeddedness levels exceed state standards throughout the region (Schuett-Hames *et al.* 1996).

Historically large woody debris (LWD) in streams was viewed as a timber commodity, a flood hazard and a barrier to navigation and fish passage. Wood was often removed from streams to address these concerns (Sedell and Luchessa 1982). Stream cleaning efforts are known to have occurred on Mill Creek (Kramer 1955) and may have occurred on other streams in WRIA 14. Today, total LWD abundance is considered acceptable in some streams, but deficient in others. Key LWD piece abundance is generally below state standards throughout the region (Schuett-Hames *et al.* 1996).

Pool frequency varies, but in general, pools are moderately abundant. Although pools are generally shallow, they often comprise a large proportion of stream surface area (Schuett-Hames *et al.* 1996). Wetlands, lakes, and beaver ponds provide off-channel habitat throughout the WRIA (Taylor *et al.* 2000). Water quality information was sparse, but the data available indicated that several streams did not meet state water temperature and dissolved oxygen standards during the summer months (Squaxin Island Tribe 2002, unpublished work). Stream flows during the summer months are generally low. On several streams, flows fell below state minimum flow standards (Squaxin Island Tribe 2002, unpublished work).

Damming of wetlands to create man-made lakes and shoreline modifications have been a common practice in WRIA 14 (TAG 2002). These activities along with conversion of forestland to agricultural or residential land uses have altered the natural flow regime of many streams in the region. Anadromous fish escapement (particularly chum salmon) to streams in WRIA 14 is generally considered sufficient to meet the nutrient requirements of the ecosystem (Baranski 2002, personal communication). However, exotic warm water fish have been introduced to many of the lakes in the WRIA, particularly within the Oakland Bay/Hammersley Inlet Subbasin, causing competition and predation problems with native salmonids (Burns 2002, personal communication).

WRIA 14 RECOMMENDATIONS

Wetlands should be protected from damming, filling, and dredging activities.

Riparian buffers should be protected to provide shade, stabilize streambanks, and provide large woody debris to enhance channel complexity.

Large woody debris should be left in streams.

Assess fish passage at the barriers identified as "Unknown Barriers" on Map 12.

Monitor biological processes including spawner escapement, exotic fish species presence, and beaver abundance.

Monitor stream flows throughout the year to evaluate flow regimes.

Monitor water temperatures and dissolved oxygen levels during the summer months.

Monitor salmonid habitat characteristics including LWD abundance, pool frequency and quality, substrate embeddedness, and floodplain connectivity.

Inventory riparian buffer characteristics including species composition, stand age, buffer width, and canopy closure.

Improve land use regulations including the Critical Area Ordinance and the Shoreline Master Program. Enforce land use regulations.

Educate landowners about the importance of maintaining natural riparian vegetation, leaving LWD in streams, and leaving banks unarmored.

Table 1. WRIA 14 Salmon and Steelhead Production Streams.

Stream Name	Stream Number	Confluence	Receiving Body	Bank
Benson Lake outlet	14.0066	7.1	Deer Creek	R
Campbell Creek	14.0069		Chapman Cove	
Canyon Creek	14.0045	0.3	Shelton Creek	L
Coffee Creek	14.0036	1.65	Goldsborough Creek	R
"County Line Creek"	14.0010	0.1	Schneider Creek	L
Cranberry Creek	14.0051		Oakland Bay	
Deer Creek	14.0027		Deer Harbor	
Deer Creek	14.0057		Oakland Bay	
"Elson Creek"	14.0025		Little Skookum Inlet	
Goldsborough Creek	14.0035		Oakland Bay	
Helser Creek	14.0124		Eld Inlet	L
Hiawata Creek	14.0085		Pickering Passage	
Jarrell Creek	14.0122		Jarrell Cove	
Johns Creek	14.0049		Oakland Bay	
Jones Creek	14.0080		Pickering Passage	
Kennedy Creek	14.0012		Totten Inlet	
Little Skookum Creek	14.0021		Skookum Creek	L
Lynch Creek	14.0026		Upper Lynch Cove	
Malaney Creek	14.0067		Oakland Bay	
"McDonald Creek"	14.0009b	1.55	Schneider Creek	L
Mill-Gosnell Creek System	14.0029		Hammersley Inlet	
N.F. Goldsborough Creek	14.0037		Goldsborough Creek	L
N.F. Helser Creek	14.0124b	0.13	Helser Creek	L
Panhandle Lake outlet	14.0041		S.F. Goldsborough Creek	L
Perry Creek	14.0001		Mudd Bay	L
Prickett Lake outlet	14.0098	7.5	Sherwood Creek	L
“Reitdorf Creek”	14.0021A		Skookum Creek	L
Rock Creek	14.0032		Gosnell Creek	L
Schneider Creek	14.0009		Totten Inlet	
S.F. Helser Creek	14.0124a	0.13	Helser Creek	R
Shelton Creek	14.0044		Oakland Bay	
Sherwood Creek	14.0094		North Bay	
Skookum Creek	14.0020		Little Skookum Inlet	
Snodgrass Creek	14.0127		Bowman Cove	
Spring Creek	14.0058	0.5	Deer Creek	L
Summit Lake System	14.0014		Kennedy Creek	R
Timber Lake	14.0072	2.6	Campbell Creek	L
Trask Lake outlet	14.0099	13.4	Schumocher Creek	L
Uncle John Creek	14.0068		Chapman Cove	
Winter Creek	14.0038		N.F. Goldsborough Creek	R

Note: Source (Washington Department of Fisheries 1975). Stream numbers greater than 14.0122 do not appear in the stream catalog. These numbers were assigned for purposes of creating the fish distribution maps for this report only.

INTRODUCTION

How to Use This Document

This report is made available in a digital format known as portable document format (pdf). This allows anyone with a computer (regardless of platform) and free Adobe Acrobat Reader ® 5.0 (or greater) software to read and print the document. If you are reading the report on your computer, you can take advantage of features commonly found on web pages. Blue underlined text appears throughout the document. These hyperlinks will take you directly to tables within the report and maps included separately on the CD-ROM. Cross-references *(within the text)* to tables and figures may also be clicked *(although they are not underlined blue text)* to take you directly to the referenced item. Definitions of some terms used in the text can be accessed by clicking this link (def.). The maps and report can be viewed simultaneously by manually opening a map from the CD-ROM *(located in the directory named PDF_Maps)* while you are reading the narrative. The Acrobat software also allows you to search for your topic of interest. Adobe Acrobat Reader is available at:

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Salmonid Habitat Limiting Factors Background

The successful recovery of naturally spawning salmon def. populations depends upon directing actions simultaneously at harvest, hatcheries, habitat and hydroelectric power, the 4H's. The 1998 state legislative session produced a number of bills aimed at salmon recovery. Engrossed Substitute House Bill (ESHB) 2496 *(later codified to RCW 77)* was a key piece of the 1998 Legislature's salmon recovery effort, with the focus directed at salmon habitat issues.

Engrossed Substitute House Bill (ESHB) 2496 in part:

- Directs the Conservation Commission in consultation with local government and the tribes to invite private, federal, state, tribal and local government personnel with appropriate expertise to act as a technical advisory group;
- Directs the technical advisory group (TAG) to identify limiting factors for salmonids and to respond to the limiting factors relating to habitat pursuant to section 8 sub 2 of this act;
- Defines limiting factors as "conditions that limit the ability of habitat to fully sustain populations of salmon;"
- Defines salmon as all members of the family salmonidae, which are capable of self-sustaining, natural production.

The overall goal of the Conservation Commission's limiting factors project is to identify habitat factors limiting production of salmon in the state. It is important to note that the responsibilities given to the Conservation Commission in ESHB 2496 do not constitute a full limiting factors analysis. The hatchery, hydroelectric power, and harvest limiting factors are being dealt with in other forums.